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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
841 Chestnut Building  
Philadelphia, Pennsylvania 19107

SUBJECT: Review of Keystone Home Well Data  
5/27/94

DATE: 6-27-94

FROM: Jennifer Hubbard, Toxicologist JR Hubbard  
Technical Support Section (3HW13)

TO: Christopher Corbett, RPM  
Central Pennsylvania Section (3HW24)

The well data have been reviewed. The contractor used the term "contaminant of concern" inappropriately. Also, all abbreviations should have been defined. Comparisons to risk-based concentrations (RBCs) and National Primary Drinking Water Regulations (NPDWRs) are summarized below.

Well RW-3 contained arsenic at 4.9 ug/l, which would correspond to a cancer risk of  $1E-4$  for a resident consuming the water for 6 years as a 15-kilogram child and 24 years as a 70-kilogram adult, 350 days per year. The concentrations of arsenic, barium (1440 ug/l), and manganese (787 ug/l) were also associated with a Hazard Quotient greater than 1 for a child receptor. The manganese would also be associated with an adult receptor Hazard Quotient greater than 1. These concentrations were below the NPDWRs of 2000 ug/l for barium and 50 ug/l for arsenic.

The concentration of arsenic in RW-7 (3.2 ug/l) would be associated with an estimated cancer risk of  $8E-5$  for a resident consuming the water for 6 years as a 15-kilogram child and 24 years as a 70-kilogram adult, 350 days per year. The arsenic concentration is less than the NPDWR of 50 ug/l.

The concentration of copper in RW-8 (590 ug/l) would be associated with a Hazard Quotient of 1 for a child receptor. This concentration is less than the Action Level of 1300 ug/l.

The concentration of lead in RW-9 (17.2 ug/l) exceeds the Action Level of 15 ug/l.

The concentration of Aroclor 1248 in RW-10 (0.13 ug/l) would be associated with an estimated cancer risk of approximately  $5E-4$ . It is extremely unusual to find PCBs in well water; resampling of this well would be strongly recommended. The concentration of arsenic in this well corresponds to an estimated cancer risk of  $8E-5$ . These concentrations are below the NPDWRs for PCBs and arsenic.

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The concentration of dieldrin in RW-12 (0.0046 ug/l) is associated with an estimated cancer risk of approximately  $2E-6$ .

The concentration of dieldrin in RW-14 (0.012 ug/l) is associated with an estimated cancer risk of approximately  $5E-6$ . The manganese concentration (176 ug/l) is associated with a Hazard Quotient of 2.3 for a child receptor.

The concentration of arsenic in RW-18 (2.6 ug/l) would be associated with an estimated cancer risk of  $7E-5$ . The arsenic concentration is below the NPDWR. The lead concentration in this well, 20.2 ug/l, exceeds the Action Level of 15 ug/l.

The concentration of arsenic in RW-20 (2.9 ug/l) would be associated with an estimated cancer risk of  $8E-5$ . The arsenic concentration is below the NPDWR. The manganese concentration (107 ug/l) is associated with a Hazard Quotient of 1.4 for a child receptor.

The dieldrin concentration in RW-21 (0.11 ug/l) is associated with an estimated cancer risk of  $5E-5$ .

The concentrations of heptachlor epoxide (0.016 ug/l) and arsenic (3.2 ug/l) in RW-24 correspond to estimated cancer risks of  $3E-6$  and  $8E-5$ , respectively. Both chemical concentrations are below NPDWRs.

The concentration of copper in RW-27 (583 ug/l) would be associated with a Hazard Quotient of 1 for a child receptor. This concentration is less than the Action Level of 1300 ug/l.

The concentrations of chloroform (6 ug/l) and carbon tetrachloride (2 ug/l) in RW-28 correspond to estimated cancer risks of  $7E-6$  and  $6E-6$ , respectively. The concentration of copper (643 ug/l) would be associated with a Hazard Quotient of 1 for a child receptor. The copper concentration is less than the Action Level of 1300 ug/l, and the volatile organic concentrations are less than the NPDWRs for these compounds.

The concentrations of all other chemicals in the wells are less than RBCs based on a Hazard Quotient of 0.1 and a cancer risk of  $1E-6$  and are also below NPDWRs.

There is high uncertainty, as much as an order of magnitude, in the arsenic cancer slope factor. There is uncertainty with the manganese non-cancer reference dose used to derive the Hazard Quotient when used to estimate child cancer risks. The children's Hazard Quotients imply greater risk for children, but children may actually be less sensitive to manganese than adults. The reference dose was derived for adults. Additional sources of uncertainty are common to the other calculations and involve uncertainty in use of standard default exposure parameters and use of reference doses and slope factors derived from experimental data.

If you have any questions concerning this review, please  
contact me at x1309.

cc: Eric Johnson (3HW13)

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